

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: § Attorney Docket No.
PATRICK J. BOHRER ET AL. § AUS920010312US1
§
Serial No.: **09/965,013** § Examiner: **BENJAMIN A. AILES**
§
Filed: **SEPTEMBER 27, 2001** § Confirmation No.: **2760**
§
For: **CONSERVING ENERGY IN A** § Art Unit: **2142**
DATA PROCESSING NETWORK §
§

APPEAL BRIEF UNDER 37 C.F.R. 41.37

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Sir:

This Brief is submitted in support of the Appeal in the above-identified application. A Notice of Appeal was filed in this case on August 8, 2006 and received in the United States Patent and Trademark Office on August 8, 2006. Please charge the fee of \$500.00 due under 37 C.F.R. §1.17(c) for filing the brief, as well as any additional required fees, to **IBM Corporation Deposit Account No. 09-0447**.

REAL PARTY IN INTEREST

The real party in interest in the present Application is International Business Machines Corporation, the Assignee of the present application as evidenced by the Assignment set forth at reel 012229, frame 0204.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellants, the Appellants' legal representative, or assignee, which directly affect or would be directly affected by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 1, 4-7, 10-15, and 18-23 stand finally rejected by the Examiner as noted in the Final Office Action dated June 15, 2006. The rejection of Claims 1, 4-7, 10-15, and 18-23 are appealed.

STATUS OF AMENDMENTS

No amendments to the claims have been made subsequent to the final rejection that leads to this appeal.

SUMMARY OF THE CLAIMED SUBJECT MATTER

As recited by Appellants' independent Claim 1, Appellants' invention provides a method of operating a data processing network. As is illustrated, *inter alia*, at **Figure 4**, reference number **402** and described at page 6, line 12 *et seq.*, the method includes performing an initial negotiation between a server of the network and a switch to which the server is connected, wherein the initial negotiation establishes an initial operating frequency of a link between the server and the switch. As is illustrated, *inter alia*, at **Figure 4**, reference number **404** and

described at page 6, line 15 *et seq.*, the method further includes determining an effective data rate of the server based on network traffic communicated over the link. As is illustrated, *inter alia*, at **Figure 4**, reference number **410** and described at page 7, line 20 *et seq.*, the method also includes, responsive to determining that the effective data rate is below the capacity of a current bandwidth of the link, performing a subsequent negotiation to establish a modified operating frequency, wherein the modified operating frequency is closer to the effective data rate than the initial operating frequency. As is illustrated, *inter alia*, in **Figure 4**, and described at page 8, line 3 *et seq.*, automatic repetition, at specified intervals during the operation of the network, of the determination of the effective data rate and the contingent initiation of a subsequent negotiation to automatically and periodically modify the operating frequency to a lowest operating frequency compatible with the effective data rate, is performed.

As recited by Appellants' independent Claim 7, Appellants' invention provides a data processing network. As is illustrated, *inter alia*, at **Figure 2**, reference number **110** and described at page 4, line 10 *et seq.*, the network includes a central switch. As is illustrated, *inter alia*, at **Figure 2**, reference number **111** and described at page 4, line 13 *et seq.*, the network includes a server device including a processor, memory, and a network interface card connecting the server device to the central switch via a link. As is illustrated, *inter alia*, at **Figure 4**, reference number **402** and described at page 6, line 12 *et seq.*, the network includes code means for performing an initial negotiation, wherein the initial negotiation establishes an initial operating frequency of the link. As is illustrated, *inter alia*, at **Figure 4**, reference number **404** and described at page 6, line 15 *et seq.*, the network further includes code means for determining an effective data rate of the server based on network traffic transmitted over the link. As is illustrated, *inter alia*, at **Figure 4**, reference number **410** and described at page 7, line 20 *et seq.*, the network also includes code means for performing a subsequent negotiation to establish a modified operating frequency responsive to determining that the effective data rate is different than a current bandwidth of the link, wherein the modified operating frequency is the lowest operating frequency accommodated by the link that is sufficient to handle the effective data rate. As is illustrated, *inter alia*, in **Figure 4**, and described at page 8, line 3 *et seq.*, the network additionally includes code means for automatically repeating, at specified intervals during the operation of the network, the determination of the effective data rate and the contingent initiation

of a subsequent negotiation to automatically and periodically modify the operating frequency to a lowest operating frequency compatible with the effective data rate.

As recited by Appellants' independent Claim 15, Appellants' invention provides a server device suitable for use in a server cluster. As is illustrated, *inter alia*, at **Figure 3**, reference number **140** and described at page 5, line 11 *et seq.*, the server includes at least one processor, and, as is illustrated, *inter alia*, at **Figure 3**, reference number **143** and described at page 5, line 9 *et seq.*, the server includes a system memory accessible to the processor. As is illustrated, *inter alia*, at **Figure 3**, reference number **121** and described at page 5, line 9 *et seq.*, the server includes a network interface card configured to connect the server device to a central switch over a link. As is illustrated, *inter alia*, at **Figure 4**, reference number **402** and described at page 6, line 12 *et seq.*, the server includes code means for performing an initial negotiation, wherein the initial negotiation establishes an initial operating frequency of the link. As is illustrated, *inter alia*, at **Figure 4**, reference number **404** and described at page 6, line 15 *et seq.*, the server further includes code means for determining an effective data rate of the server based on network traffic transmitted over the link. As is illustrated, *inter alia*, at **Figure 4**, reference number **410** and described at page 7, line 20 *et seq.*, the server also includes code means for performing a subsequent negotiation to establish a modified operating frequency responsive to determining that the effective data rate is different than a current bandwidth of the link, wherein the modified operating frequency is the lowest operating frequency accommodated by the link that is sufficient to handle the effective data rate. As is illustrated, *inter alia*, in **Figure 4**, and described at page 8, line 3 *et seq.*, the server additionally includes code means for automatically repeating, at specified intervals during the operation of the network, the determination of the effective data rate and the contingent initiation of a subsequent negotiation to automatically and periodically modify the operating frequency to a lowest operating frequency compatible with the effective data rate.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

- I. The Examiner's rejection of Claims 1, 4-7, 10-15, and 18-23 under 35 U.S.C. § 103(a) as being unpatentable over United States Patent number 6,876,668 to Chawla *et al.* (*Chawla*) in view of United States Patent number 6,292,834 to Ravi *et al.* (*Ravi*) is to be reviewed on appeal.

ARGUMENT

- I. The Examiner's rejection of Appellants' Claim 1 as being unpatentable over Chawla in view of Ravi does not present a *prima facie* case of obviousness and should be overturned, because the Examiner's proposed combination of Chawla and Ravi does not teach or suggest all elements of Applicants' exemplary Claim 1.

As set forth in M.P.E.P. § 2142, “[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. With respect to exemplary Claim 1, and by extension to claims 4-7, 10-15, and 18-23 Appellants respectfully submit that the Examiner's proposed combination of *Chawla* and *Ravi* does not render obvious Applicant's invention, because the proposed combination does not teach or suggest the claimed features of Appellant's invention for which it is cited.

- A. The proposed combination of Chawla and Ravi does not teach or suggest “determining an effective data rate of the server based on network traffic communicated over the link”.

Appellants' Claim 1, as well as independent Claims 7 and 15, recite “determining an effective data rate of the server based on network traffic communicated over the link”. The

Examiner cites *Chawla* at Col. 12, line 61 – Col. 13, line 4 as teaching “determining an effective data rate of the server based on network traffic communicated over the link”. The cited text of Columns 12 and 13 discloses:

“Continuing with the example, the bandwidth reservation processor **500** in each device **201-B** through **201-E** receives the RSVP path and bandwidth reservation request messages. If the bandwidth reservation processor **500** determines that a requesting application or host (e.g., receiving hosts **210-A2** or **210-A3**) has permission or privileges to reserve the requested bandwidth (e.g., RSVP policy control) and also determines that the requested resource (e.g., the 100 Kbps bandwidth) is available in the device **201**, the bandwidth reservation processor **500** in each data communications device **201-B** through **201-E** grants the request and establishes the 100 Kbps bandwidth reservation for the "A" data stream **203** along the path from sending host **210-A1** to receiving hosts **210-A2** and **210-A3**.”

Appellants respectfully submit that the cited text of *Chawla* fails to teach or suggest “determining an effective data rate of the server based on network traffic communicated over the link”, which is illustrated, *inter alia*, at **Figure 4**, reference number **404** and described at page 6, line 15 *et seq.* Instead, the cited text section discloses only an initial *negotiation based on availability*, rather than “*determining an effective data rate of the server based on network traffic* communicated over the link”. Alternatively stated, *Chawla*, teaches attempting to reserve network capacity, to the extent that it is available, while Appellants’ limitation recites a determination of the actual capacity initially being utilized by the server. To assert that the selected passage of *Chawla* teaches or suggests “*determining an effective data rate of the server based on network traffic* communicated over the link” is analogous to arguing that the act of seeking a reservation for a seat on an airplane is equivalent to the act of entering the plane and determining the present occupant of a seat. The combination of *Ravi* and *Chawla* teaches a theoretical allocation of what should be available, while Appellants’ Claim 1 recites determining what is actually used.

Because the recited feature of “*determining an effective data rate of the server based on network traffic* communicated over the link” is neither taught nor suggested by the combination of *Chawla* and *Ravi*, and is neither taught nor suggested by either of them separately, the

Examiner has not articulated a *prima facie* case of obviousness under 35 U.S.C § 103(a). In the absence of such a *prima facie* case, the Examiner's rejection of Claim 1, Claim 7, Claim 15 and all claims depending from them is without merit and should be overturned.

B. The proposed combination of Chawla and Ravi does not teach or suggest “responsive to determining that the effective data rate is below the capacity of a current bandwidth of the link, performing a subsequent negotiation to establish a modified operating frequency, wherein the modified operating frequency is closer to the effective rate than the initial operating frequency”.

Appellants' Claim 1, as well as independent Claim 7 and Claim 15 recite “responsive to determining that the effective data rate is below the capacity of a current bandwidth of the link, performing a subsequent negotiation to establish a modified operating frequency, wherein the modified operating frequency is closer to the effective rate than the initial operating frequency”, which is illustrated, *inter alia*, at **Figure 4**, reference number **410** and described at page 7, line 20 *et seq.* The proposed combination of *Chawla* and *Ravi* does not teach or suggest this recited feature. The Examiner cites *Chawla* at Col. 13, lines 20–24. The cited text states:

“If a video client application (not shown) executing on recipient host **210-A3** senses that more network bandwidth is required (such as **120 Kbps**) to effectively receive the "A" video data stream **203**, the host **210-A3** can use RSVP to make a bandwidth reservation request (not shown) containing bandwidth allocation adjustment information to each network device **201-E, 201-D, 201C** and **201-B**.”

Appellants respectfully submit that “*a video client application (not shown) executing on recipient host 210-A3 senses that more network bandwidth is required* (such as 120 Kbps) to effectively receive the "A" video data stream **203**” does not teach or suggest “performing a subsequent negotiation to establish a modified operating frequency, wherein the modified operating frequency is closer to the effective rate than the initial operating frequency”. The determination taught by *Chawla* centers on whether the application ‘needs’ additional bandwidth, but does not teach or suggest modifying the available bandwidth to meet the effective

rate of actual capacity utilization of the link. This difference in the purpose and function is so great that one skilled in the relevant art would not be motivated by the ‘needs’ determination taught in the proposed combination of *Chawla* and *Ravi* to create the step recited in Appellants’ claim 1.

Because the recited feature of “responsive to determining that the effective data rate is below the capacity of a current bandwidth of the link, performing a subsequent negotiation to establish a modified operating frequency, wherein the modified operating frequency is closer to the effective rate than the initial operating frequency.” is neither taught nor suggested by the combination of *Chawla* and *Ravi*, and is neither taught nor suggested by either of them separately, the Examiner has not articulated a *prima facie* case of obviousness under 35 U.S.C § 103(a). In the absence of such a *prima facie* case, the Examiner’s rejection of Claim 1, Claim 7, Claim 15 and all claims depending from them is without merit and should be overturned.

CONCLUSION

Appellants have pointed out with specificity the manifest error in the Examiner’s rejections, and the claim language that renders the invention patentable over the combination of references. Appellants, therefore, respectfully request that the rejection of all pending claims be reversed.



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APPENDIX

WHAT IS CLAIMED IS:

1. A method of operating a data processing network, comprising:

performing an initial negotiation between a server of the network and a switch to which the server is connected, wherein the initial negotiation establishes an initial operating frequency of a link between the server and the switch;

determining an effective data rate of the server based on network traffic communicated over the link; and

responsive to determining that the effective data rate is below the capacity of a current bandwidth of the link, performing a subsequent negotiation to establish a modified operating frequency, wherein the modified operating frequency is closer to the effective data rate than the initial operating frequency;

automatically repeating, at specified intervals during the operation of the network, the determination of the effective data rate and the contingent initiation of a subsequent negotiation to automatically and periodically modify the operating frequency to a lowest operating frequency compatible with the effective data rate.

2-3. (canceled)

4. The method of claim 1, wherein the initial and subsequent negotiation are compliant with the IEEE 802.3 standard.

5. The method of claim 1, wherein determining the effective data rate includes accumulating information indicative of the amount of network traffic during a specified interval and calculating an effective data rate based thereon.

6. The method of claim 1, further comprising, responsive to determining that the effective data rate is greater than a specified percentage of the current bandwidth, performing a subsequent negotiation to establish a modified operating frequency, wherein the modified operating frequency is higher than the current operating frequency.

7. A data processing network, comprising:
 - a central switch;
 - a server device including a processor, memory, and a network interface card connecting the server device to the central switch via a link;
 - code means for performing an initial negotiation, wherein the initial negotiation establishes an initial operating frequency of the link;
 - code means for determining an effective data rate of the server based on network traffic transmitted over the link;
 - code means for performing a subsequent negotiation to establish a modified operating frequency responsive to determining that the effective data rate is different than a current bandwidth of the link, wherein the modified operating frequency is the lowest operating frequency accommodated by the link that is sufficient to handle the effective data rate; and
 - code means for automatically repeating, at specified intervals during the operation of the network, the determination of the effective data rate and the contingent initiation of a subsequent negotiation to automatically and periodically modify the operating frequency to a lowest operating frequency compatible with the effective data rate.

8-9. (canceled)

10. The network of claim 7, wherein the initial and subsequent negotiation are compliant with the IEEE 802.3 standard.
11. The network of claim 7, wherein the code means for determining the effective data rate includes code means for accumulating information indicative of the amount of network traffic during a specified interval and calculating an effective data rate based thereon.
12. The network of claim 7, further comprising, code means for performing a subsequent negotiation to establish a modified operating frequency responsive to determining that the effective data rate is greater than a specified percentage of the current bandwidth, wherein the modified operating frequency is higher than the prior operating frequency.

13. The network of claim 7, wherein the initial and subsequent negotiations are initiated by the central switch.

14. The network of claim 7, wherein the initial and subsequent negotiations are initiated by the server device.

15. A server device suitable for use in a server cluster, comprising:
- at least one processor;
 - a system memory accessible to the processor;
 - a network interface card configured to connect the server device to a central switch over a link;
 - code means for performing an initial negotiation, wherein the initial negotiation establishes an initial operating frequency of the link;
 - code means for determining an effective data rate of the server based on network traffic transmitted over the link; and
 - code means for performing a subsequent negotiation to establish a modified operating frequency responsive to determining, that the effective data rate is different than the current bandwidth of the link, wherein the modified operating frequency is the lowest operating frequency accommodated by the link that is sufficient to handle the effective data rate;
 - code means for automatically repeating, at specified intervals during the operation of the network, the determination of the effective data rate and the contingent initiation of a subsequent negotiation to automatically and periodically modify the operating frequency to a lowest operating frequency compatible with the effective data rate.

16-17. (canceled)

18. The server device of claim 15, wherein the code means for determining the effective data rate includes code means for accumulating information indicative of the amount of network traffic during a specified interval and calculating an effective data rate based thereon.

19. The server device of claim 15, further comprising, code means for performing a subsequent negotiation to establish a modified operating frequency responsive to determining

that the effective data rate is greater than a specified percentage of the current bandwidth, wherein the modified operating frequency is higher than the prior operating frequency.

20. The server device of claim 15, wherein the network interface card includes a clock unit configured to provide a clocking signal that controls the link operating frequency, and further wherein the code means for establishing the modified operating frequency includes code means for programming a clock register that controls the frequency of the clocking signal.

21. A computer program product comprising computer executable instructions, stored on a computer readable medium, for conserving energy in a data processing network having a switch, a server, and a link connecting the switch to the server, the instructions comprising:

instructions for detecting that the link is underutilized including instructions for determining that a capacity of a current bandwidth of the link is greater than an effective data rate of the link;

instructions for responding to said detecting by reducing an operating frequency of the link; and

instructions for automatically repeating, at specified intervals, said instructions for detecting and said instruction for responding to automatically and periodically modify the operating frequency to a lowest operating frequency compatible with the effective data rate.

22. The computer program product of claim 21, further comprising instructions for determining the effective data rate of the link, wherein the effective data is indicative of an amount of data traversing the link during a specified interval.

23. The computer program product of claim 22, further comprising:

instructions for detecting that the link is over-utilized include instructions for determining that a current bandwidth of the link is less than an effective data rate of the link; and

instructions for responding to said detecting that the link is over-utilized by increasing an operating frequency of the link.

EVIDENCE APPENDIX

Other than the Office Action(s) and reply(ies) already of record, no additional evidence has been entered by Appellants or the Examiner in the above-identified application which is relevant to this appeal.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings as described by 37 C.F.R. §41.37(c)(1)(x) known to Appellants, Appellants' legal representative, or assignee.